

What Is Claimed Is:

1. A device for a motor vehicle that affords occupant protection during the impact of energy directed laterally against a motor vehicle door (6) as a result of a collision, the device having a connecting structure (7) comprising at least two parts, a first part and a second part of which the first part (T1) is firmly connected to the motor vehicle door (6) and the second part (T2) is firmly connected to an energy-absorbing area of the motor vehicle body (5) located in the interior of the motor vehicle (1) and the two parts can be brought to enter an active connection via at least one common joining section (F) for selective diversion of at least a part of the impact energy acting laterally on the motor vehicle door (6) into the area of the body of the motor vehicle (5),

wherein the first and/or second part (T1, T2) undergo, due to energy input to a transformable material, a change in mechanical state in particular in the form of a change in shape due to which the two parts are made to adjoin and interlock.

2. The device according to claim 1,

wherein the first part (T1) and/or the second part (T2) each have conform-designed joining contours in the joining section (F).

3. The device according to claim 2,

wherein the conform joining contours of both parts (T1, T2) are designed in such a manner that the first part (T1) at least partially encloses or partially enters the second part (T2) in the joining section (F).

4. The device according to one of the claims 1 to 3,
wherein the two parts (T1, T2) are made to adjoin in the joining section (F) by closing the motor vehicle door (6).
5. The device according to one of the claims 1 to 4,
wherein the two made-to-adjoin parts (T1, T2) are interlockable and unlockable.
6. The device according to one of the claims 1 to 5,
wherein the transformable material is made of at least one of the following classes of material: piezo-ceramics, piezo-polymer, electrostrictive ceramics, electrorheological fluid, polymer gel, magnetorheological fluid, shape-memory alloy, shape-memory polymer.
7. The device according to one of the claims 1 to 6,
wherein the first part(T1) and/or the second part (T2) or at least partial areas of the first and/or second part are made of a transformable material which undergoes a change in shape directly before and during the impact of energy directed at the motor vehicle door as a result of a collision in such a manner that the two parts enter a firm, dissoluble active connection.
8. A device according to one of the claims 1 to 7,
wherein on or in the motor vehicle, an approach sensory mechanism is provided, which detects an unavoidable collision situation and generates a signal by means of which the at least one active element and/or the intelligent structure is activatable.
9. The device according to one of the claims 1 to 8,
wherein the motor vehicle door (6) is a side door and the second part (T2) is attached in the floor region of the motor vehicle body next to or under the substructure of the seat.

10. The device according to one the claims 1 to 9,
wherein the change in mechanical state yields an effect which influences the vibration behavior and/or dampening behavior of the transformable material.

11. The device according to one of the claims 1 to 10,
wherein the energy input to the transformable material is independent of the crash energy.

What Is Claimed Is:

Disclosed is a device for a motor vehicle that affords occupant protection during the impact of energy directed laterally against a motor vehicle door (6) as a result of a collision, the device having a connecting structure (7) comprising at least two parts, a first part and a second part of which the first part (T1) is firmly connected to the motor vehicle door (6) and the second part (T2) is firmly connected to an energy-absorbing area of the motor vehicle body (5) located in the interior of the motor vehicle (1) and the two parts can be brought to enter an active connection via at least one common joining section (F) for selective diversion of at least a part of the impact energy acting laterally on the motor vehicle door (6) into the area of the body of the motor vehicle (5).

The invention is distinguished by the first and/or second part (T1, T2) undergoing, due to energy input to a transformable material, a change in mechanical state in particular in the form of a change in shape due to which the two parts are made to adjoin and interlock.

(Fig.)